

TWO NEW NEMATODES PARASITIC IN THE KIWI IN NEW ZEALAND

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SYNOPSIS

Two new species of nematodes, *Heterakis gracilicauda* sp. nov. and *Cyrnea (Cyrnea) apterycis* sp. nov., are described from the kiwi (*Apteryx* sp.) in New Zealand.

INTRODUCTION

THROUGH the kindness of Mr D. M. Rutherford of the Whangarei Animal Health Laboratory, Whangarei, South Island, New Zealand, a small collection of nematodes obtained from a kiwi (*Apteryx* sp.) was received for study. So far as the writer is aware, the only record of nematodes occurring in *Apteryx* appears to be that of Chatin (1884, 1885), who gave a very brief and inadequate description of a form that he called *Ascaris apterycis*. This species does not seem to have been met with again, and it is therefore not surprising that the present material has proved to be very interesting, consisting as it does of two new species which are described below.

DESCRIPTION OF SPECIES

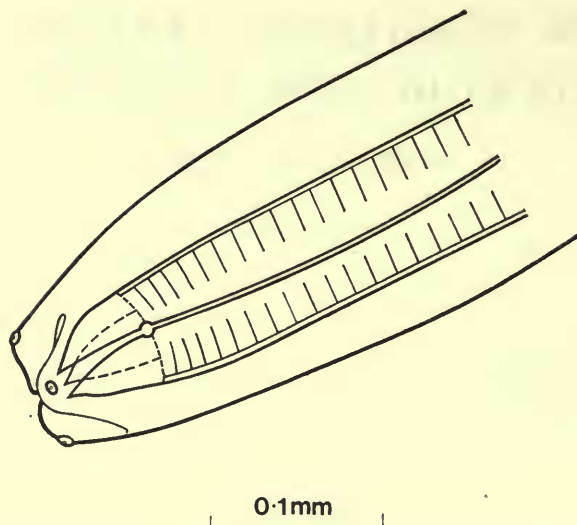
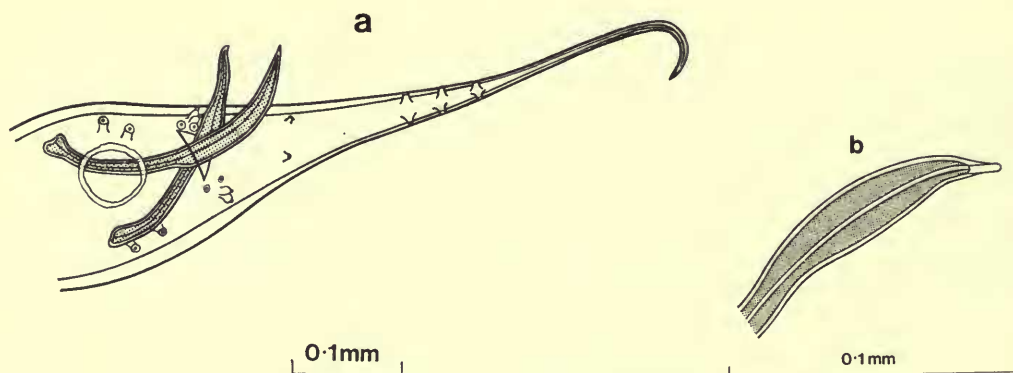
Family **HETERAKIDAE** Railliet & Henry, 1914

Heterakis gracilicauda sp. nov.

(Figs 1 & 2)

DESCRIPTION. This description is based upon specimens from the caecum of *Apteryx* sp. in South Island, New Zealand.

The male measures 3.3–4.4 mm in length and 0.17–0.33 mm in maximum thickness and the female 5–6.4 mm and 0.19–0.3 mm, respectively. The head bears the usual three lips without interlabia, and no teeth have been made out (Fig. 1). The diameter of the head taken just at the base of the lips is approximately 42–49 μ m. There is a short pharynx measuring 30 μ m in length, and this leads into an oesophagus terminating inwardly in a distinct bulb, which measures

FIG. 1. *Heterakis gracilicauda* sp. nov.: lateral view of head.FIG. 2. *Heterakis gracilicauda* sp. nov.: (a) ventral view of male tail ;
(b) tip of spicule.

0.14–0.16 mm in length and 0.11–0.13 mm in width. The total length of the pharynx together with the oesophagus, including the bulb, is 0.52–0.7 mm in the male and 0.7–0.85 mm in the female. The nerve-ring is situated at approximately 0.17 mm from the anterior end of the body. The excretory pore occurs just posteriorly to the nerve-ring at 0.26 mm from the anterior end. No cervical papillae have been observed.

The caudal end of the male is long, slender and tapering, ending in a long, thin process. It measures 0.49–0.52 mm from the cloaca to the extreme tip of the tail. The caudal alae are narrow and little developed. The sucker is situated at 59–70 μ m from the cloaca, and has a well-defined, chitinous rim. It measures 48–52 μ m in diameter from the outside of the sucker rim. There appear to be ten pairs of

caudal papillae arranged as shown in Fig. 2a. These are disposed as two pairs of pedunculate papillae around the sucker, two pairs of sessile papillae lateral to the cloaca and two large pairs of pedunculate papillae lateral to these. The other four pairs are distributed along the tail, and it is just posterior to the hindmost pair that the tail begins to narrow gradually.

The spicules are short, alate and constantly subequal, measuring 0.24–0.29 mm for the left and 0.16–0.18 mm for the right. They have a granulated appearance, are narrow proximally, but expanded slightly in their distal regions. The left spicule is constantly longer than the right and each spicule bears a small process at the tip, as shown in Fig. 2b. The vulva is situated anteriorly to the middle of the body, at approximately 2 mm from the anterior end. This leads into a muscular vagina which runs posteriorly for a short distance before opening into the uterus. The eggs measure 58–60 μm \times 30–35 μm .

MATERIAL. British Museum (Nat. Hist.) Reg. no. 1974 : 577–627 (syntypes).

DISCUSSION. Inglis, Schmidt & Kuntz (1971) have divided the genus *Heterakis* into species-groups, based upon the structure and the relative lengths of the spicules. The present species in having subequal alate spicules falls into their '*Heterakis gallinarum*' group. Of the species in this group, *H. gracilicauda* is most similar to *H. isolonche* Linstow, 1906, but differs from it in the length of the spicules, those of the new species being less than half the length of those reported for *H. isolonche*. The ratio of spicule-length : body-length in *H. isolonche* is 1 : 9 for the left spicule and 1 : 7 for the right, in *H. gracilicauda* it is 1 : 20 for the right spicule and 1 : 15 for the left. It appears that in all the male specimens of *H. gracilicauda* examined the left spicule is longer than the right. This is somewhat unusual, because in other members of the '*H. gallinarum*' group, the relationship of the left spicule to the right is reversed.

It is interesting to note that in the collections of the British Museum (Natural History) there are specimens of *H. gallinarum** and of *H. isolonche* from Australia and of *H. beramporia* from New Guinea. It would seem, therefore, that the '*H. gallinarum*' species-group as defined by Inglis, Schmidt & Kuntz is quite widespread in the Australasian region.

Family SPIRURIDAE Oerley, 1885

Cyrnea (*Cyrnea*) *apterycis* sp. nov.

(Figs 3, 4, 5 & 6 ; Pls 1 & 2)

DESCRIPTION. This description is based upon specimens from the gizzard of *Apteryx* sp. in South Island, New Zealand.

The body is cylindrical and the cuticle is provided with fine, transverse striations. The male measures 3.5–6.8 mm in length and 0.19–0.26 mm in maximum thickness, and the female 4.8–7.4 mm and 0.2 mm, respectively. The head has a diameter of 30–40 μm . The dorsal and ventral lips are well developed and rather deeply bilobed, each bearing a median process. Both the lobes of each lip carry two

papillae, a large one adjacent to a small one. The two lateral lips or 'pseudolips' carry at their bases the three pairs of teeth typical of the subgenus (*Cyrnea*) (Pls 1 & 2). A large papilla-like structure is visible on each of the lateral lips and posteriorly to this there is a small amphid.

The oesophagus is, as usual, in two parts, a short anterior portion and a longer posterior portion, the total length being 1.1–1.8 mm in the male and 1.6–2.3 mm in the female. The nerve-ring is situated anteriorly to the junction of the two oesophageal regions, at about 0.20–0.26 mm from the anterior end of the body. No cervical papillae have been observed. The features of the caudal end of the male are exceedingly difficult to make out, as the tail of each male specimen is, as so often happens in spiruroid nematodes, coiled in a tight, double spiral. Nevertheless, the caudal alae are wide and well developed, and the tail is covered over a wide area of its ventral surface with cuticular elevations, which are arranged in longitudinal rows, extending forward to a position just anteriorly to the beginning of the alae. There are eleven pairs of papillae, which are disposed in the manner usually found in the genus *Cyrnea*, and shown in Fig. 3. There are four pairs of large, pedunculated, pre-anal papillae, situated just laterally and anteriorly to the cloaca, and two

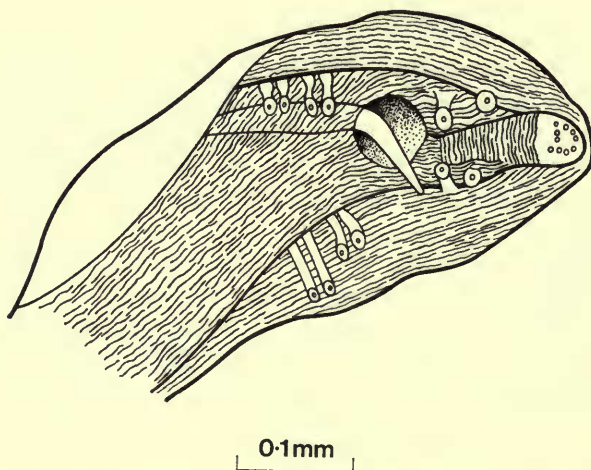


FIG. 3. *Cyrnea (Cyrnea) apterycis* sp. nov.: ventral view of male tail.

pairs posterior to the cloaca, whilst the remaining five pairs are very small and are distributed at the tip of the tail. They are arranged in two rows, each of four papillae, with the fifth pair lying centrally between the two rows. The spicules are unequal and dissimilar. The left spicule is long and slender, measuring 0.9–1.3 mm in length, and possesses a barbed tip (Fig. 4b). The right spicule is shorter and stouter, measuring only 0.18–0.25 mm in length and ends in a fine point. The proximal end is cup-shaped, as shown in Fig. 4a. In lateral view, the gubernaculum appears triangular in outline and measures 0.46–0.48 mm by 0.36–0.38 mm.

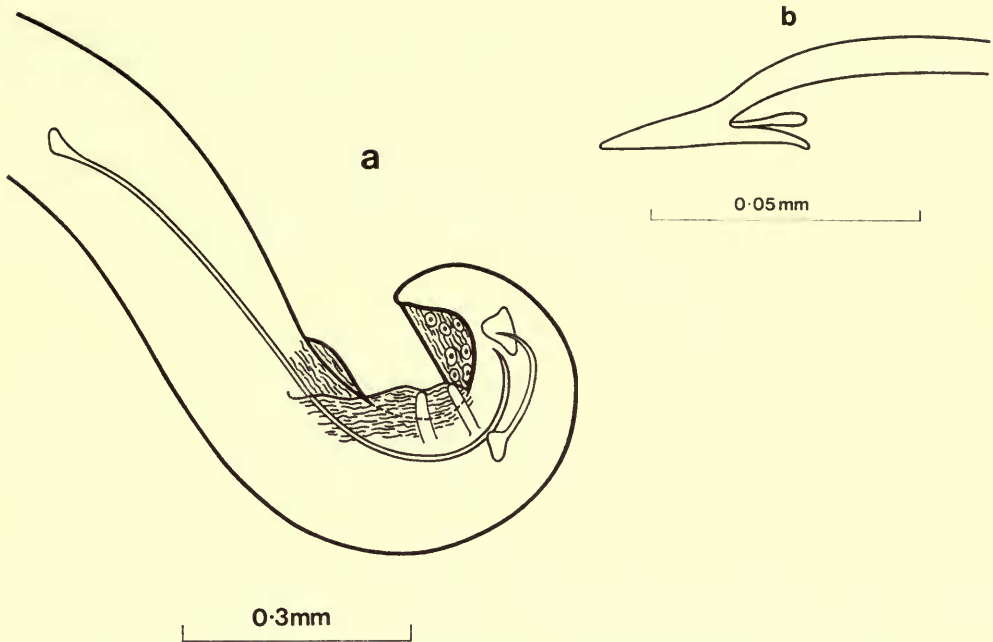


FIG. 4. *Cyrnea (Cyrnea) apterycis* sp. nov.: (a) lateral view of male tail; (b) tip of left spicule.

The tail of the female is conical and in some specimens it bears a small, flattened mucron at the tip (Fig. 5). The vulva is situated at 2.6–4.6 mm from the anterior end. From the vulva, the long muscular vagina runs backwardly to enter the

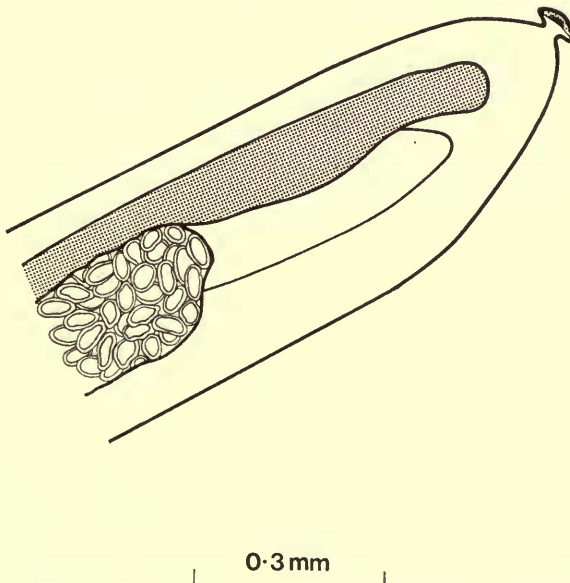


FIG. 5. *Cyrnea (Cyrnea) apterycis* sp. nov.: ventral view of female tail.

uterus, which bifurcates. One of the two uterine branches appears to run anteriorly for a short distance before bending posteriorly to run parallel with the other branch of the uterus (Fig. 6). The eggs measure 40–50 μm by 24–28 μm .

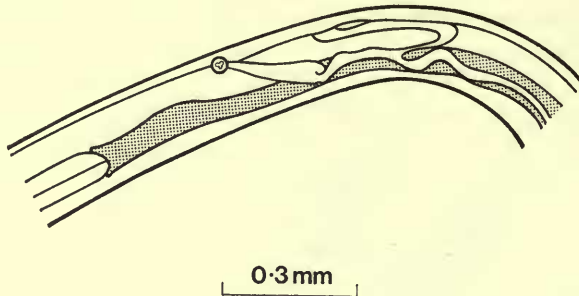


FIG. 6. *Cyrnea (Cyrnea) apterycis* sp. nov.: vulval region of female.

MATERIAL. British Museum (Nat. Hist.) Reg. no. 1974:628–667 (syntypes).

DISCUSSION. Chabaud (1958) has divided the genus *Cyrnea* into two subgenera, *Cyrnea (Cyrnea)* and *Cyrnea (Procyrnea)*. The position of the teeth on the 'pseudolips', situated deep in the buccal capsule, places the present specimens in the subgenus *Cyrnea (Cyrnea)*. In another work published later in the same year, Chabaud & Rousselot (1958) presented a differential key to the species of *Cyrnea (Cyrnea)*, and this key divided the subgenus into ten groups. In this key, the present specimens fall into their group 9, which includes *C. (C.) eurycerca* Seurat, 1914. This is regarded by these authors as the only valid species known hitherto in this group, for both *C. (C.) graphophasiani* Yamaguti, 1935, and *C. (C.) euplocami* Maplestone, 1930, are considered to be synonymous with *C. (C.) eurycerca*. *C. (C.) apterycis* differs from the latter species in having shorter spicules, and in the more anterior position of the vulva. It may also be distinguished by the number and distribution of the caudal papillae on the male tail. In *C. (C.) apterycis* there are six pairs of large, pedunculated papillae plus five pairs of small, sessile papillae, whilst in *C. (C.) eurycerca* there are only five pairs of large papillae, one pair of adanal and four pairs of small sessile papillae. The new species also possesses a barb-like tip to the left spicule.

Of the species described since Chabaud & Rousselot presented their key, only *C. (C.) ochotensis* Belogurov & Zueva, 1967, and *C. (C.) singhi* Ali, 1961, can be referred to the *C. (C.) eurycerca* group. *C. (C.) ochotensis*, described from *Falco subbuteo* in the U.S.S.R., differs from the present form in the greater length of its spicules. *C. (C.) singhi*, from *Centropus sinensis* in India, can be distinguished from *C. (C.) apterycis* by its much longer right spicule, by the number of cloacal papillae and by the apparent possession of only two pairs of teeth on the 'pseudolips'.

C. (C.) casuarii (Maplestone, 1932) has been placed by Chabaud and Rousselot in a separate group of its own. This species is mentioned here because it appears to be the only member of the subgenus to have been described hitherto from an Australian bird—*Casuarinus biarunculatus*. This nematode differs from the form

described above in its large size, being 4–7 times as long as *C. (C.) apterycis*, and in the number and arrangement of the caudal papillae of the male tail.

It is interesting to note that according to Mawson (1968), although *Cyrnea* spp. are fairly common in Australian birds, all have been determined as belonging to the subgenus *Cyrnea* (*Procyrnea*). She appears to have ignored *C. (C.) casuarii*, presumably because the host was resident in the Calcutta Zoo at the time of its death, but it is more probable that the infestation was a natural one rather than one acquired in India.

ACKNOWLEDGEMENTS

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PLATE I

Cyrnea (Cyrnea) apterycis – stereoscan micrographs of head

(a) Lateral view.

(b) Dorsal view.